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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: : X. Nguyen
HEINZ GREINER :
Serial No.: 09/777,122 : Group: 3683
Filed: February 5, 2001 :
For: LINEAR ROLLING BEARING :

600 Third Avenue
New York, N.Y. 10016
September 18, 2003

BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Sir:

REAL PARTY IN INTEREST

The real party in interest is INA Walzlager Schaeffler oHG by way of an assignment from the inventors recorded in the Patent Office.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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STATUS OF THE CLAIMS

Claims 1, 2 and 4 to 6 are rejected and claims 3 and 7 stand allowed.

STATUS OF THE AMENDMENTS

The response filed on June 11, 2003 was entered for purposes of appeal but was not deemed to put the application in condition for allowance.

SUMMARY OF THE INVENTION

The present invention is directed to a linear rolling bearing comprising a guide carriage with a U-shaped cross-section having a U-cross bar and two U-legs whereby the guide carriage forms a carriage cavity and partially surrounds a guide rail while being slightly supported by balls on two longitudinal sides of the guide rail with each U-leg of the guide carriage having on an inner surface opposing the guide rail a ground raceway with an approximately quarter circle cross-section for the balls with the raceway being made by a grinding wheel whose diameter is larger than a diagonal dimension of the carriage and whose axis and rotation is situated outside of the guide carriage to form an acute angle with an axis of symmetry of the guide carriage wherein the stop surface having a retaining contour for a guide member containing the balls is configured on a

guide rail-distal outer surface of each U-leg of the guide carriage and the raceway on one of the two U-legs and stop surface having the retaining contour on the other of the two U-legs are made in common in a single work step by the grinding wheel.

THE PRIOR ART

Tonogi et al

EP 318980-A1

June 1989

THE ISSUES

Claims 1, 2 and 4 to 6 stand rejected under 35 USC 102 as being anticipated by or under 35 USC 103 as being obvious over the Tonogi et al patent which, according to the Examiner, shows a linear rolling bearing comprising a guide carriage with a U-shaped cross-section in Figure 8 where having a U-cross bar and two U-legs whereby the guide carriage forms a carriage cavity and partially surrounds a guide rail while being sidably supported on balls on two longitudinal sides of the guide rail, each U-leg of the guide carriage having an inner surface opposing the guide rail, a round raceway with possibly a quarter circle cross-section for the balls and a stop surface 21 having a retaining contour for a guide member 50 containing the balls B configured on a guide rail-distal outer surface of each U-leg of the guide carriage. The Examiner deems it would have been obvious to construct the Tonogi et al linear rolling bearing using a one step process to save cost and time.

APPLICANT'S ARGUMENTS

Applicant respectfully requests the Board of Patent Appeals and Interferences to reverse the Examiner's rejection since the Tonogi et al reference neither anticipates nor renders obvious Applicant's invention.

The Tonogi et al reference discloses a linear ball bearing having a guide carriage designated as a bearing body and has a leg section with an upper groove with an approximately semi-circular cross-section for load bearing balls and a lower groove with approximately a quarter circle cross-section for load bearing balls. A drawback of this configuration lies in the continuation of the radius of the upper groove up to the inner vertical wall of the leg section which necessarily means that for making the upper groove by grinding, a small grinding wheel must be used.

Because of the semi-circular cross-section of the upper groove for the load bearing balls, Tonogi et al is unable to use a grinding wheel corresponding to Applicant's construction which calls for a raceway 10 with an approximately quarter circle cross section for the balls 3 to be made by a grinding wheel 18 whose diameter is larger than a diagonal dimension of the carriage cavity and whose axis of rotation 19 is situated outside of the guide carriage 1 thereby forming an acute angle α with an axis of symmetry 20 of the guide carriage 1. The advantage obtained by Applicant's construction is that Applicant's grinding wheel has a large diameter as discussed on page

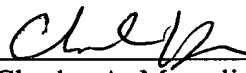
1, the last paragraph through line 3 of page 2 wherein it is stated that at the same speed of rotation, a higher peripheral speed is obtained with the grinding wheel having a large diameter rather than a wheel having a small diameter. With a larger diameter, a higher grinding performance and a prolongation of the duration of the wheel are obtained. The rotational speed of the grinding spindle cannot be infinitely increased because this would lead to a destruction of the bearings.

This advantage is not taught by Tonogi et al and therefore, Tonogi et al neither anticipates nor renders obvious Applicant's invention since it does not have the characterizing portion of Applicant's invention whereby a stop surface has a retaining contour for a guide member containing the balls is configured on a guide rail-distal outer surface of each U-leg of the guide carriage and the raceway on one of the two U-legs and the stop surface has the retaining contour on the other of the two U-legs made in common in one work step by the grinding wheel. Therefore, it is deemed that Tonogi et al does not anticipate or render obvious Applicant's invention.

CONCLUSION

It is believed that Applicant has complied with all the requisites for the granting of Letters Patent and the Board of Patent Appeals and Interferences is respectfully requested to reverse the Examiner's rejection. Three copies of the appeal brief are being filed herewith as well as PTO Form-2038 authorizing the \$320.00 fee for filing the appeal brief.

Respectfully submitted,
Muserlian, Lucas and Mercanti



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CAM:ds
Enclosures



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APPENDIX

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The claims in the application are:

Claim 1 (rejected)

A linear rolling bearing comprising a guide carriage with a U-shaped cross-section having a U-crossbar and two U-legs so that the guide carriage forms a carriage cavity and partially surrounds a guide rail while being slidably supported through balls on two longitudinal sides of the guide rail, each U-leg of the guide carriage having on an inner surface opposing the guide rail a ground raceway with an approximately quarter circle cross-section for the balls, the raceway being made by a grinding wheel whose diameter is larger than a diagonal dimension of the carriage cavity and whose axis of rotation is situated outside of the guide carriage and forms an acute angle (α) with an axis of symmetry of the guide carriage, **characterized in that** a stop surface having a retaining contour for a guide member containing the balls is configured on a guide rail-

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distal outer surface of each U-leg of the guide carriage, and the raceway on one of the two U-legs and the stop surface having the retaining contour on the other of the two U-legs are made in common in one work step by the grinding wheel.

Claim 2 (rejected)

A bearing of claim 1 wherein the acute angle (α) that the axis of rotation of the grinding wheel forms with the axis of symmetry of the guide carriage is about 15°.

Claim 3 (allowed)

A linear rolling bearing comprising a guide carriage with a U-shaped cross-section having a U-crossbar and two U-legs so that the guide carriage forms a carriage cavity and partially surrounds a guide rail while being slidably supported through balls on two longitudinal sides of the guide rail, each U-leg of the guide carriage having on an inner surface opposing the guide rail a ground raceway with an approximately quarter circle cross-section for the balls, the raceway being made by a grinding wheel whose diameter is larger than a diagonal dimension of the carriage cavity and whose axis of rotation is situated outside of the guide carriage and forms an acute angle (α) with an axis of symmetry of the guide carriage, **characterized in that** a stop surface having a retaining contour for a guide member containing the balls is configured on a guide rail-distal outer surface of each U-leg of the guide carriage, and the raceway on one of the two U-legs and the stop surface having the retaining contour on the other of the two U-

legs are made in common in one work step by the grinding wheel the ground raceway of each U-leg of the guide carriage is situated nearer the U-crossbar, and each U-leg comprises on the inner surface another raceway that is situated further away from the U-crossbar and has an approximately quarter circle cross-section for the balls, the two raceways situated further away from the U-crossbar end in an imaginary plane connecting centers of corresponding load-bearing balls arranged on the two longitudinal sides of the guide rail.

Claim 4 (rejected)

A bearing of claim 1 wherein the guide members containing the balls are detachably fixed on the guide carriage and extend in longitudinal direction from raceways of the guide rail, the balls form endless ball circuits and the guide members comprise for each ball circuit, a region for load-bearing balls, a return canal for returning balls and two deflecting canals that connect the region for load-bearing balls and the return canal to each other at ends thereof.

Claim 5 (rejected)

A bearing of claim 4 wherein each return canal made in the guide member comprises an opening extending along an entire length of the return canal, and said opening also extends along each deflecting canal.

Claim 6 (rejected)

A bearing of claim 5 wherein a width of the opening of the return canal is smaller than a diameter of the balls inserted in the return canal.

Claim 7 (allowed)

A bearing of claim 3 wherein the raceway nearer the U-crossbar and the raceway further away from the U-crossbar on one of the two U-legs and the stop surface having the retaining contour on the other of the two U-legs are made in common in one work step by the grinding wheel.